



US006052575A

United States Patent [19][11] **Patent Number:** **6,052,575****Lähdemäki et al.**[45] **Date of Patent:** **Apr. 18, 2000**

[54] **SYSTEM FOR TRANSMITTING CHARGE INFORMATION TO A WIRELESS SUBSCRIBER VIA A FORWARDED SUPERVISORY SIGNAL**

5,046,085 9/1991 Godsey et al. 455/407 X
5,809,124 9/1998 Bayod 455/407 X

FOREIGN PATENT DOCUMENTS

135196 3/1985 European Pat. Off. .
95/20298 7/1995 WIPO .
96/03832 2/1996 WIPO .

Primary Examiner—Wellington Chin
Assistant Examiner—Philip J. Sobutka
Attorney, Agent, or Firm—Pillsbury Madison & Sutro

[75] **Inventors:** Heimo Lähdemäki, Pirkkala; Timo Kononen, Tyrnävä ; Jussi Sarpola; Olli Litnmaa, both of Oulu, all of Finland

[73] **Assignee:** Nokia Telecommunications Oy, Espoo, Finland

[21] **Appl. No.:** 08/930,989

[22] **PCT Filed:** Apr. 12, 1996

[86] **PCT No.:** PCT/FI96/00204

§ 371 Date: Feb. 9, 1998

§ 102(e) Date: Feb. 9, 1998

[87] **PCT Pub. No.:** WO96/32822

PCT Pub. Date: Oct. 17, 1996

[30] **Foreign Application Priority Data**

Apr. 13, 1995 [FI] Finland 951806

[51] **Int. Cl.⁷** H04Q 7/00

[52] **U.S. Cl.** 455/407; 455/422; 455/550

[58] **Field of Search** 455/405, 406, 455/407, 408, 409, 422, 550; 379/143, 155, 229, 235

[56] **References Cited****U.S. PATENT DOCUMENTS**

4,640,986 2/1987 Yotsutani et al. 455/407 X

[57] **ABSTRACT**

The invention relates to a radio system realizing a wireless subscriber interface, the system including a subscriber station (1) which comprises means (8, TRX) for forwarding, on the radio path, a supervisory signal received on the radio path, a base station (5) which monitors the connection to the subscriber station by means of the supervisory signal, and a subscriber network element (6) for transmitting communication signals between a communication system (PSTN) and the subscriber station (1). In order to transmit charging information, the subscriber network element (6) comprises detecting means (9) for detecting a home metering pulse transmitted from the communication system (PSTN), whereby the control unit (11) is arranged to control the supervisory means (10, 14) for sending a charging signal to the subscriber station (5) by means of the supervisory signal in response to detecting the home metering pulse, and the subscriber station (1) comprises a detecting means (12) for detecting the charging signal, and a signal generator (13) responsive to the detecting means (12) for generating and feeding a home metering pulse to the user interface (2) in response to detecting the charging signal.

9 Claims, 2 Drawing Sheets